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BULLETIN
OF THE
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Fresh-Water Algae. VI.

By Francis Wolle.

(Plate xiii.)

The following is a partial list of fresh-water algae collected by myself and by interested contributors during the past summer (1881). The addition to the recognized forms of the algae of the United States is not so large as that made in some previous years ; nevertheless it indicates that our waters have not yet been fully explored. More forms ought to be found ; indeed, some genera are not as yet represented. Why do we find no *Sphaeroplea?* Good forms of *Prasiola* have not yet occurred, except from the Rocky Mountains ; while less conspicuous forms, well known in Europe, are also wanting.

GOMPHOSPHAERIA, Ktz.—*G. aponina*, Ktz., var. CORDIFORMIS, *n. var.* (Plate xiii, Fig. 11). G. thallo primario laete aeruginoso, deinde pallide aurantiaco, vel expallescenti ; tegumentis achromaticis, subcrassis ; cellulis numerosis, densis ; cellulis marginalibus distincte cordiformibus, paullo longioribus quam latioribus ; cellulis in medio, a vertice visis, bicocciformibus ; cytioplasmate granulato aerugineo vel expallescente. Diam. cellul. .0005″–.0006″ ; long. .0006″–.0008″ ; crass, .0003″–.0004 .

Hab. Small ponds near Bethlehem, Penn.

This plant differs from *G. aponina*, Ktz., in the form of the cellules, which are decidedly heart-shaped, not "cuneate." The coenobia and the cellules are fully twice the size of those of the only species described.

SPIRILLUM, Ehrb.—*S. undula*, Ehrb. Hab. Small ponds, Penn.

SPIRULINA, Link.—*S. Jenneri*, Hass. Hab. Ponds, Penn.

OSCILLARIA, Boss.—*O. littoralis*, Carm. ; coll. by R. Hitchcock in submarine waters, New York. *O. crassissima*, Rab., in trenches, Penn. *O. detersa*, Stitz.; coll. by Dr. A. Seipt in a pool in Luray Cave, Va., 260 ft. below the surface.

PHORMIDIUM, Ktz.—*P. inundatum*, Ktz., on moist earth, S. Car.; coll. by H. W. Ravenel. *P. tinctorium*, Ktz., coll. by C. G. Pringle, April, in springs, Arizona.

CALOTHRIX, Ag.—*C. gracilis*, Rab., on river stones in shallow water, Penn. *C. affinis*, Menegh., through R. Hitchcock, from Sandwich Islands.

DIMORPHOCOCCUS, A. Br.—*D. lunatus*, A. Br., New Jersey.

PALMODACTYLON, Naeg.—*P. simplex*, Naeg., coll. by R. Hitchcock, in Croton water, New York.

OOCYSTIS, Naeg.—*O. Naegelii*, A. Br., frequent in ponds, Penn. and New Jersey.

PEDIASTRUM, Meyen.—*P. simplex*, Meyen ; typical form (Plate xiii, Figs. 1 and 1′ ; two new varieties, Figs. 1″ and 1‴.) *P. biradiatum*, Meyen; all collected by R. Hitchcock in the New York City supply of Croton water.

SORASTRUM, Ktz.—*S. echinatum*, Ktz., ponds, N. J. and Pa.

GONIUM, Müller.—*G. pectorale*, Mull., in ponds, N. J.

POLYEDRIUM, Naeg.—*P. minimum*, A. Br., in ponds, Penn.

SPIROGYRA, Link.—*Sp. orbicularis*, Hass., abundant in fruit in a small stream, Bethlehem, Pa. *Sp. bellis*, Hass., Budd's Lake, N. J. *Sp. condensata* coll. by H. H. Rusby near Silver City, New Mexico. *Sp. quadrata*, Hass., in river near Bethlehem, Pa. *Sp. setiforme*, Roth., not new except in the condition of the spores, which present the early stages of development. *Sp. fluviatilis*, Hilse. European authors are united in declaring the fruiting of this species unknown. October 8th last I was fortunate in finding the plant in fine fruit in a pond near Bethlehem, Pa.

The diagnosis should be corrected to read, " Sp. saturate viridis, minus lubrica ; articulis sterilibus cylindricis, diametro (.1014″--.00159) 2-6-plo longioribus ; sporiferis valde tumidis ; sporis aut ovalibus aut late ellipticis ; diametro .0021″–.0023″ ; long. .003″–.0033″ ; fasciis spiralibus 4 sublatis, anfractibus densissimis."

MESOCARPUS, Hass.—*M. depreſsus*, Hass., Mobile, Ala., coll. by M. S. McNeil. *M. recurvus*, Hass., St. Lawrence River, coll. by I. M. Adams.

STAUROSPERMUM, Ktz.—*S. quadratum*, Ktz., in small stream, S. Carolina, coll. by H. W. Ravenel.

RHIZOCLONIUM, Ktz.—RH. HOSFORDII, *n. sp.*—Rh. laete saturate viride, vel luteolo-viride, crispatum, rigidum, filis ramulos breves unicellulares numerosos emittentibus ; articulis diametro (0.016″) 2-4-6 plo longioribus ; cytiodermate crasso hyalino homogeneo.

Collected near Aurora, N. Y., by F. H. Hosford. It is nearest *Rh. Casperi*, Harw., but is much firmer, nearly twice the size ; and is purely a fresh-water plant.

ULOTHRIX, Ktz.—*U. Jurgensii*, Ktz., coll. by H. W. Ravenel in rice-field ditches near Darien, Ga.

CLOSTERIUM, Nitzsch.—*C. Ehrenbergii*, Menegh, var. IMMANE, *n. var.*, differs from the typical form mainly in size. Measures .0083″ diameter, nearly twice the diameter of the largest variety of this genus on record. Collected in Budd's Lake, N. J., Aug. 1, 1881.

COSMARIUM, Corda.—*C. anisochondrum*, Nord., in Denmark Pond, N. J. *C. bireme*, Nord., in ponds, Penn. and N. J. *C. Clepsydra*, Nord., Budd's Lake, N. J. *C. globosum*, Bulnh., in ponds, Penn. and N. J. *C. galeritum*, Nord., in ponds, N. J. *C. Holmiense*, Lund., on Mt. Mansfield, Vt., coll. by F. H. Hosford. *C. nitidulum*, De. Not., coll. by F. H. Hosford. *C. orthostichum*, Lund., in Denmark Pond, N. J. *C. punctatum*, Bréb., Penn., N. J. and Mass. *C. pseudogranatum*, Nord., N. J. *C. quadrifarium*, Lund., Mt. Marcy, Vt. *C. rupestre*, Naeg., Mt. Marcy, Vt. *C. taxichondrum*, Lund., Mt. Marcy, Vt. (The last three were collected by Rev. H. D. Kitchel. The last-named species I have since found not uncommon in New Jersey.) *C. monomazum*, Lund., near var. *polymazum*, Nord., (Plate XIII, Figs. 15 and 15′), but differs in having 6 papillae on each side of the semi-cells instead of 1 on one side and 4 on the other, Denmark Pond, N. J.

COSMARIUM KITCHELII, *n. sp.* (Plate XIII ; Fig. 3, front view ;

3′, side view; 3″, end view.) C. submediocre diametro quarta parte longius, profunde constrictum; sinu lineari angusto; semicellulis perfecte semicircularibus; angulis inferioribus subrectis, in margine verrucis circiter 18, et intra marginem seriebus 1 vel 2 concentricis verrucarum ornatis; in centro granulis plerumque 6 in series 2 transversas ordinatis; e vertice visis ovato-ellipticis, granulis in medio seriebus 4 ordinatis; utrinque ternis granulis ornatis; a latere visis circularibus, granulis utrinque 2 et in medio seriebus 4 ordinatis. Latitudo isthmi tertia pars diametri transversalis corporis; long. .00133″ (=34μ); lat. .0016″ (=40μ.)

Hab. In a pond, Hammonton, N. J. Collected by Rev. H. D. Kitchel. This species is readily recognized by the end or side view; in the former, by the two large marginal granules, and in the latter by the four rows of smaller central granules.

BAMBUSINA, Ktz.—B. DELICATISSIMA, *n. sp.*—B. fasciis praelongis, nodosis; cellulis cylindricis, diametro (.00023″–.0003″) 4-5-plo longioribus, a medio duabus vittis transversis annuliformibus instructis; annulis plus elevatis quam latis. Trichomatibus, cum annulis, .0006″–.0007″.

Hab. In a pond, Pleasant Mills, N. J.

I have deemed this plant worthy of separation from the usual form: it has only about one-third the diameter of the trichoma proper, the rings are much more elevated, and the length of the cells is usually fully four times the diameter.

EUASTRUM, Ehrb.—*E. inerme*, Lund., and *E. erosum*, Lund., both from ponds in Penn. and N. J. *E. divaricatum*, Lund., in pond, New Jersey.

GONATOZYGON, De By.—G. PILOSUM, *n. sp.* (Plate XIII, Fig. 16.) G. cellulis elongatis diametro 12-20-plo longioribus, laxe connexis, cytiodermate plus minus dense spinuloso; spinis tenuibus, rectis, hirsutis; cellulis cylindricis utroque polo non constrictis, nisi cellulis terminatibus modice attenuatis, polo rotundato. Diam., sine spinis, .0006″–.0006″; cum spinis .001″.

Separated from other forms mainly by the vesture of hairs. Frequent in ponds of New Jersey.

MICRASTERIAS, Ag.—*M. foliacea*, Bailey. Prof. Bailey discovered this plant in Rhode Island more than thirty years ago. After seven years of searching I have at last rediscovered it in Denmark Pond, New Jersey, where it occurs in abundance. Dr. Nordstedt found it in Brazil. Studying from the somewhat imperfect figure, he made a new var. *ornata*. There is no doubt that I have the original form, and that the Brazilian plant is the same. A peculiarity of this species is that it is rarely found singly. The polar lobe projects considerably, and is furnished with two surface teeth. As the plant multiplies by division, these projecting lobes lap over each other and cling together; they are usually found in series of 4-10.

In the same pond are also interesting varieties of *Micrasterias truncata*, Corda., one only .002″ in length and breadth. *M. muricata*, Bailey, occurred frequently last summer, as did also *M. laticeps*, Nord., which is the same as Wood's *disputata* of later date.

STAURASTRUM, Meyen.—*St. muricatum*. Bréb. *St. pecten*, Perty. *St. Brasiliense*, Nord., (first discovery of this plant north of the Gulf States). *St. rotula*, Nord.. (Plate XIII, Fig. 9.) *St. Ophiura*, Lund., in two new varieties, described by the names TETRACERUM, (four-armed) (Plate XIII, Fig. 4.) and PENTACERUM, (five-armed) (Plate, XIII, Fig. 5.) All of these were collected in Denmark Pond, New Jersey. *St. furcatum*. Ehrb., in Croton water, New York, coll. by R. Hitchcock. *St. Pseudosebaldi*, Nord., in Budd's Lake, N. J.

STAURASTRUM DIVARICATUM, *n. sp.* (Plate XIII, Fig. 12.) St. parvum, paullo longius quam latius, granulato-asperum ; sinu lineari angustissimo ; semicellulis subquadratis, angulis superioribus in cornu elongatum divaricatum, apice bifido, productis ; a vertice visum forma pentagonali, quinque-radiatum. Diam., sine cornibus, .0015″.

Hab. In a pond, Hammonton, N. J. Coll. by Rev. H. D. Kitchel.

This species approaches my *St. pusillum*, but is somewhat larger and has not 4 but 5 arms, which are not obtuse but bifid.

STAURASTRUM CORONATUM, *n. sp.* (Plate XIII, Fig. 16.) St. submagnum, dupla parte circa latius quam longius ; sinu angusto-lineari; semicellulis fere obovatis, lateribus in cornu incurvum productis, sursum sensim dilatatis, in apice convexo processibus dentiformibus in coronam ordinatis ; semicellulis a vertice visis 6-radiatis, in medio coronula papillarum ornatis; radiis apice subtiliter trifidis, marginibus delicate serrato-dentatis. Long. .0018″ ; lat. .0033″ ; isth. .001″.

Hab. Denmark Pond, New Jersey.

This plant has the crown-teeth of *St. rotula*, Nord., but not the size, number of arms, nor the serration.

STAURASTRUM DISTENTUM, *n. sp.* (Plate XIII, Figs. 7 and 7′.) St. mediocre, leve; semicellulis fere obovatis, sursum sensim dilatatis, apice convexo-crenulatis; angulis superioribus in radium elongatum gracilem substrictum productis ; margine non denticulato, apice profunde trifido distento. Semicellulis a vertice visis 5-vel rarius 6-radiatis, apice radiorum tridentato, dilatato, inter bases hastatas sinu profunde lineari. Diam. et long., cum rad., .0016″.

Hab. Ponds, Sussex Co., N. J.

The sinus between the hastate bases of the radii, reminds one of my *St. pulchrum* (TORREY BULL., April, 1880,) but the sinuses are linear, not circular, and the ends of the radii are not obtuse but trifid, with the three teeth unusually large and spreading.

STAURASTRUM FUSIFORME, *n. sp.* (Plate XIII, Fig. 8.) St. submagnum, semicellulis angusto-fusiformibus, angulis lateris in processus longissimos achroos margine crenato-dentato apice bifurcato productis ; dorsum subacutangulare, crenatum; semicellulis a vertice fusiformibus, lateribus in radios rectos, gracillimos attenuatis, apice bifido. Diam., cum rad., .005″-.0055″ ; long. .0015″.

This species appears to be related to *St. leptocladum*, Nord., and *St. grallatorium*, Nord., but differs from both in form of cell ; from the former in the length of body, and from the other in the absence of the produced back and the aculei.

STAURASTRUM KITCHELII, *n. sp.* (Plate XIII, Figs. 2 and 2′.) St. parvum, circiter tam longum quam latum, leve ; semicellulis ellipticis divergentibus, introrsum ventricosis, dorso plus minus inflato, angulis in processus bifurcos productis, a vertice triangularibus, medio processibus similibus tribus radiatis ordinatis. Diam. .0015″–.200″.

Coll. by Rev. H. D. Kitchel in Gilder Pond, Mt. Marcy, Vt.

Ralf's *St. spinosum* bears a similarity, but is separated by having two or more spines on each side beside the one terminating each angle. *St. furcatum*, Ehrb., is also akin, but has more spines. These forms are moreover, granularly roughened, not smooth. The spines are not properly "lateral" but central, the ends projecting over the sides.

Staurastrum proboscidium, Bréb., var. AMERICANUM, *n. var.* (Plate XIII, Fig. 10.) This plant was collected in Crystal Bay, St. Lawrence River, Canada, by J. M. Adams. It bears some similarity to a variety of *St. asperum*, described by Brébisson, and also to a form, *Javanica*, described by Nordstedt; but it differs in the arrangement of the granules and in the shape of the rays (proboscidii), which are longer and more cylindrical.

STAURASTRUM TRIDENTIFERUM, *n. sp.* (Plate XIII, Fig. 13.) St. exiguum leve, sinu amplissimo; semicellulis ellipticis, dorso convexo, vel subplano, angulis in aculeos tres rectos divaricatos productis, a vertice visis triangularibus, lateribus modice retusis, tribus aculeis in angulos impositis. Diam. sine aculeis .0008″; cum ac., .001″. Hab. in a pond near Bethlehem, Pa.

This plant is nearest a form of *St. dejectum*, but is separated by the three spines at the angles.

XANTHIDIUM, Ehrb.—XANTHIDIUM TETRACENTROTUM, *n. sp.* (Plate XIII, Figs. 14 and 14′, front and end view. X. parvum, circiter tam latum quam longum, leve, constrictione acute cuneata (non lineari); semicellulis subreniformibus vel subhexagonalibus, basi subplana, dorso late rotundo-truncato, uno angulo mediano utrinque in aculeos geminatos breves acutos producto; tuberculo centrali minus elevato; cytiodermate levi vel serie singula parvularum granularum praedito. Diam., sine sp. .0013″–.0015″; cum sp., .0024″–.0025″; long. .0015″–.0016″.

Hab. Ponds, Sussex Co., New Jersey.

The shape of the semicells is very near that of *X. fasciculatum*, but they are much smaller and bear only two pairs of aculei, not four or six.

BATRACHOSPERMUM, Roth.—*B. vagum*, Roth., var. RAVENELII, *n. var.* B. bi-tri-polices longum, crassum flavo-aerugineum, sine corticulo, vel rarius ramulis accessoriis; articulis diametro (ad.006″.) plerumque aequalibus vel paulo plus minus, achrois; ramis primariis parcis; ramulis verticilli plerumque brevibus; verticillis confertissimis, nonnumquam nullis, sed saepius quoque geniculo cum 2–3 fasciculis brevissimis instructo.

Collected by H. W. Ravenel, at St. John's, Berkley, S. C.

This is a distinct form, particularly in the absence of the accessory filaments which constitute the corticular covering or rind of the primary filaments. Bory is credited with a variety of like character, but of dark purple color, verticils far apart and branchlets long; mine on the contrary is of yellowish green or light aeruginous color, verticils very close and branchlets very short. The articulations or cells of the stems are short, colorless, often much contracted at the joints ; this feature causes some parts of the filaments to have a striking resemblance to forms of *Draparnaldia*.

The Fruits of Cucurbita.

BY C. C. PARRY.

(Plate XIV.)

It naturally happens that the fruits, even of common plants, especially those of a fleshy or bulky character, are poorly represented in herbaria. In consequence of this fact, the descriptions in systematic works are often defective in this important particular. I propose, as a small contribution towards supplying such defects, to present some outline sketches, and diagnostic characters of three species of *Cucurbita* that have lately come under my notice.

In all the generic descriptions of *Cucurbita* the fruit is represented as three-celled, *i. e.*, with three placentas.

It is now over thirty years since my attention was cursorily called to the fact that a species of *Cucurbita*, not uncommon in the vicinity of San Diego, California, was quite constantly 5-celled. From want of sufficient material this species remained unnoticed, till lately described by Mr. Watson as *Cucurbita palmata*, but without his noticing its 5-celled fruit.

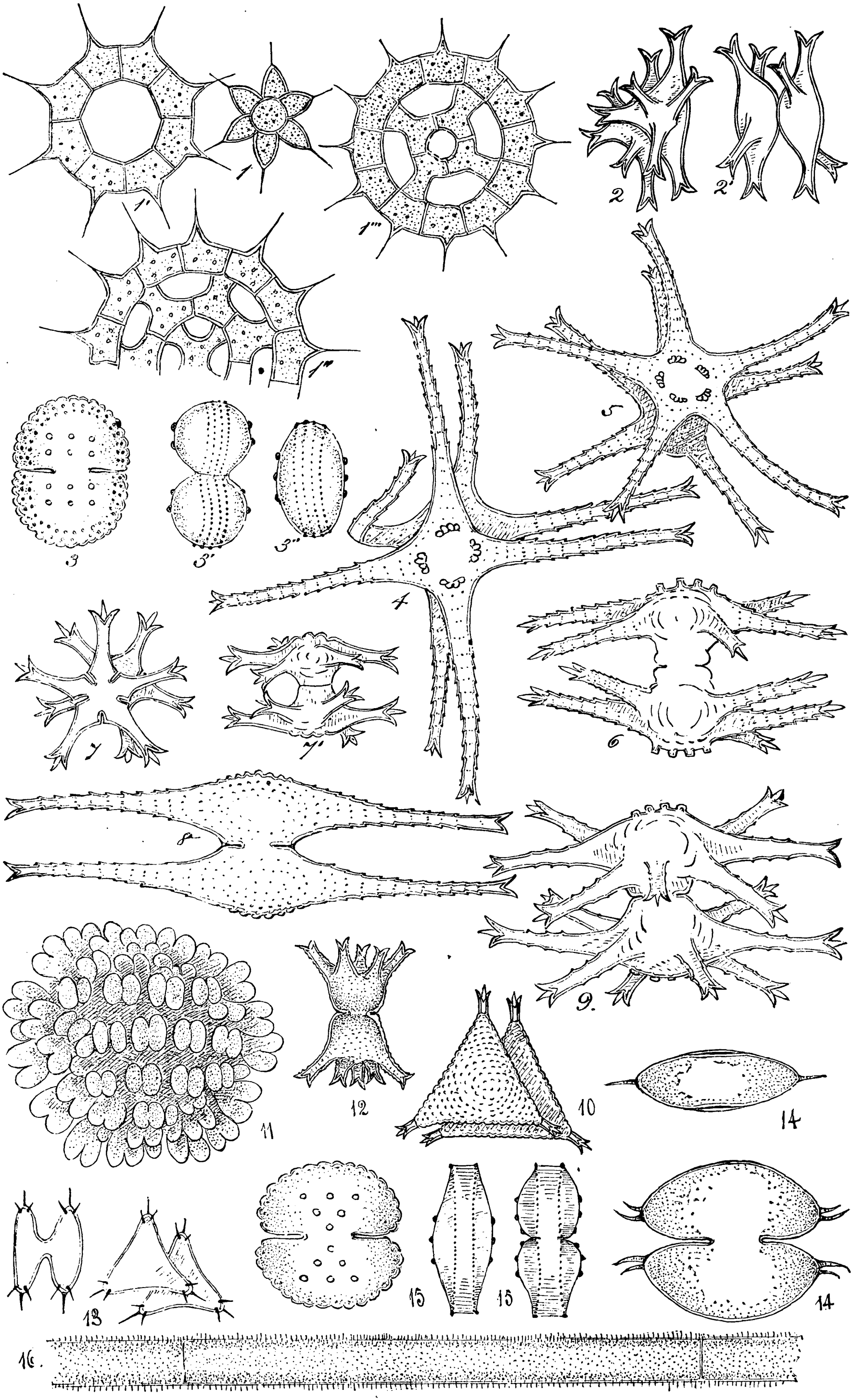
Another still older species, of Arizona, *Cucurbita digitata*, Gray, is also found to possess the same character, having 5 placentas. It is perhaps something more than a coincidence, that both these species, as well as the doubtful *Cucurbita Californica*, Watson, have five-lobed leaves, as distinguished from *Cucurbita perennis*, Gray, in which the leaves are triangular, and the fruit normally 3-celled. The accompanying sketches (all natural size) will help to exhibit these characters, and also show the usual variation in size of fruit and seed.

Referring to each in regular order we note the following diagnostic characters :

Cucurbita perennis, Gray.—Fruit orbicular, medium size, 2–2½ inches in diameter, normally 3-celled (occasionally, in large specimens, 4-celled); outside marking lemon-yellow on a greenish ground, longitudinal lines irregular, *i. e.*, not corresponding to internal divisions ; placentas thin, separating at maturity; seed unevenly curved, its length 4-5 lines, about twice its breadth, with raised margins.

Cucurbita digitata, Gray.—Fruit rather flattened, orbicular, 2-3 inches in diameter, normally 5-celled, (rarely 6); outside marking brownish yellow, the longitudinal lines very distinct, corresponding closely to the 10 internal divisions, the lines corresponding to the thickened placentas being the broadest ; seeds evenly ovate, light brown, 4-5 lines long, less than one-half the breadth, thick, without raised margins.

Cucurbita palmata, Watson.—Fruit orbicular, 3-5 inches in diameter, 5-celled (rarely 6); outside markings more blotched, green and light yellow, longitudinal markings moderately prominent and usually



NEW FRESH-WATER ALGAE.